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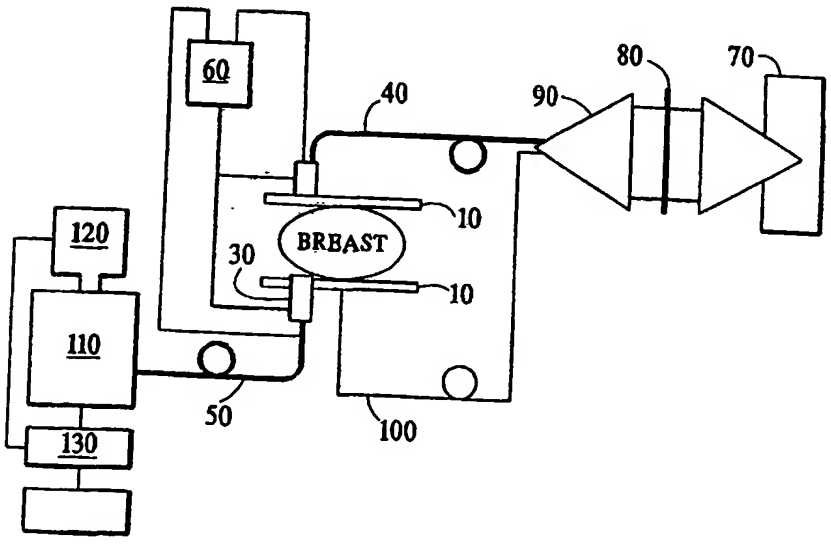
(54) Title: OPTICAL IMAGING AND OXIMETRY OF TISSUE



(57) Abstract: Systems and methods are disclosed for detecting at least one region of a sample having an absorption level different from a background level of absorption in the sample by obtaining thicknesses of the sample and intensities of light transmitted through the sample at a plurality of locations. The system includes glass plates (10) for compressing the tissue, distance sensors (20, 30), illuminations fibers (40) connected to a light source (70), and collection fibers (50) connected to spectrograph (110). Spatial second derivatives are calculated from products of the thicknesses of the sample and the intensities of the transmitted light for the locations. The data points are compared to detect the region of the sample having an absorption level different from the background level of absorption within the sample. The new systems and method can be used to optically image, detect, and characterize tissue, lesions, such as cancer.

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